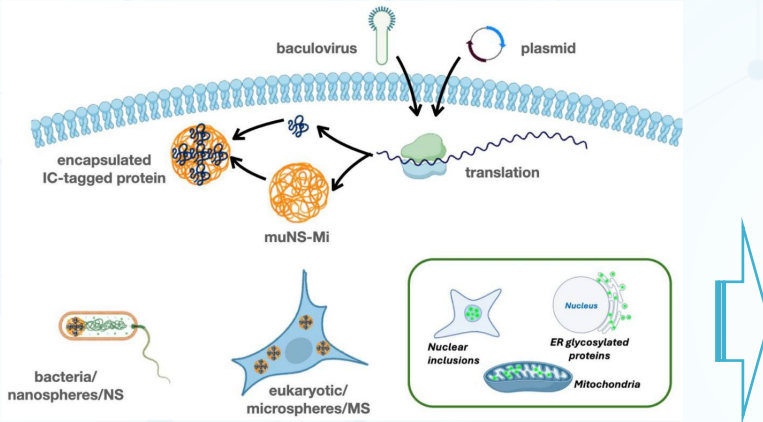


Prof. José Mtnez.-Costas

Intra-Cellular micro or nanospheres (MS/NS) loaded with your (glycol)proteins of interest



- ✓ Simplicity, cost effective & easy production
→ *Cells do the work: **express & “encapsulate”**.*
- ✓ Proteins properly folded and completely functional.
→ *Can also work inside ER: **glycoproteins**.*
- ✓ Allows highly specific **covalent surface modification** with any desired molecule, unaffecting the activity

➤ Subunit Particle Vaccines (Platform):

- **Human.** SARS-COV-2 vaccine project funded by the European Vaccine Initiative (EVI) and ISCIII Health Research Institute (Spain).

Ongoing works: enveloped viruses, e.g., Crimea-Congo, Rift Valley Fever.

- **Animal.** Recombinant vaccines incorporating Bluetongue (BTV) or African Horse Sickness viruses' epitopes generated significant levels of neutralizing antibodies, protecting mice towards a lethal challenge. Ongoing: EHDV, PRSV.

Vaccines **2022**, *10*(7), 1124; *Vaccine*, **2020**, *38*, 882-889; *Antiviral Research*, **2017**, *142*, 55

➤ Biomedical applications (collaborations with Clinical Hospital):

- Oral-delivered, enzyme replacement therapy (metabolic diseases), e.g., Phenylketonuria
- Biomarkers isolation. Post-translational modifications & ubiquitin-like proteins
- Cancer immunotherapy (Collaborations with NIBSC, UK)

➤ Toxic or difficult-to-express proteins, antigens, antibodies...

- Completely functional, lyophilizable & easily purified.
- Working inside the endoplasmic reticulum: modified viral glycoproteins.

Examples: (i) Membrane-bound IGRP, (ii) Viral glycoprotein from Rift Valley Fever Virus, *Scientific Reports*, **2018**, 16286